

FIGURE 1B

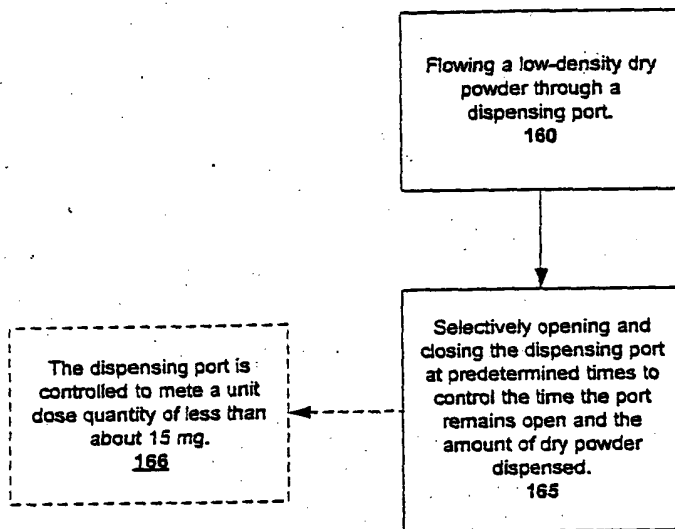
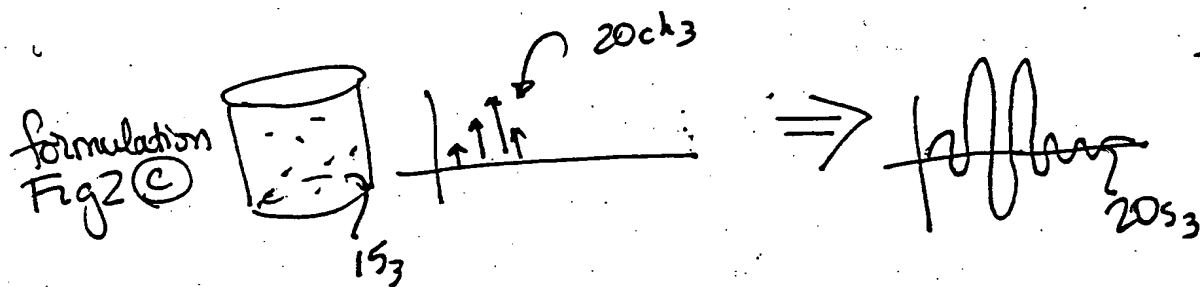
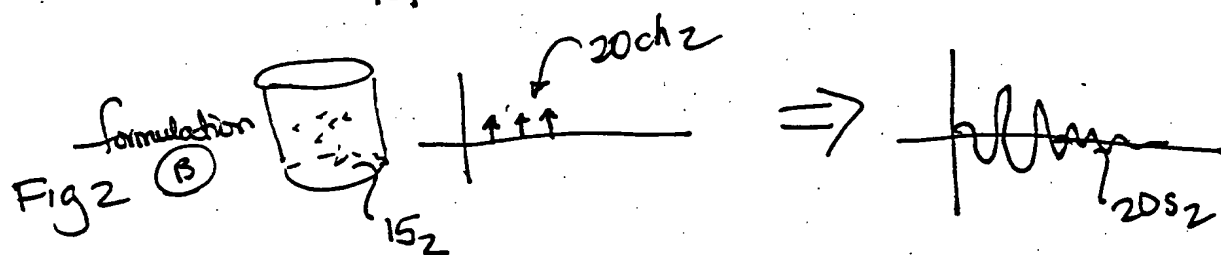
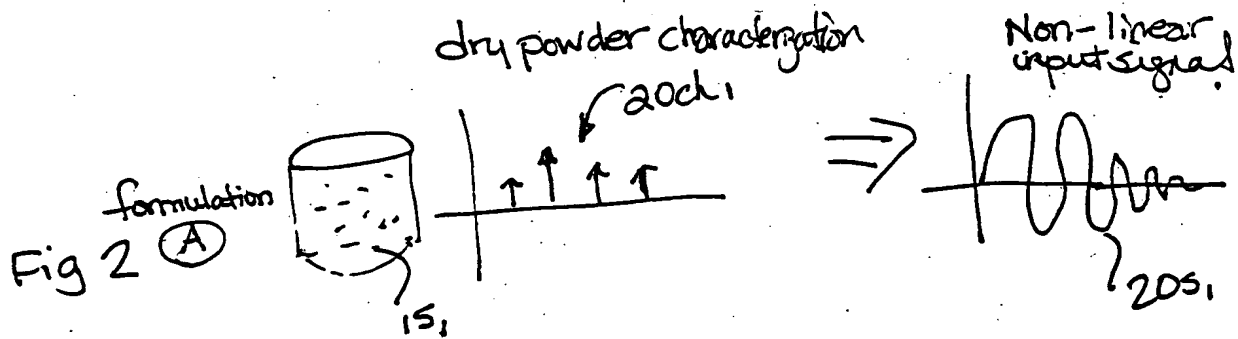


FIGURE 1C



SIGNAL GENERATION ALGORITHM

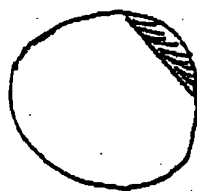


Fig. 3A

Measure time between
arches for
pawlers in
rotating drum

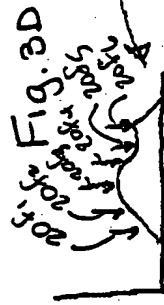


Fig. 3D

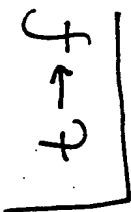
Record top six most

observed frequencies,

typically representing
75% of distribution



Fig. 3B



convert time
to frequency
space

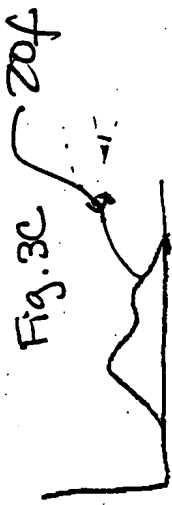


Fig. 3C

plot distribution
at frequencies

20s

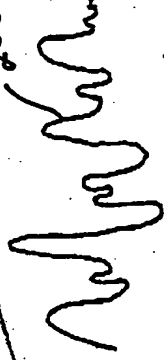


Fig. 3E

Superimpose these six

frequencies to construct

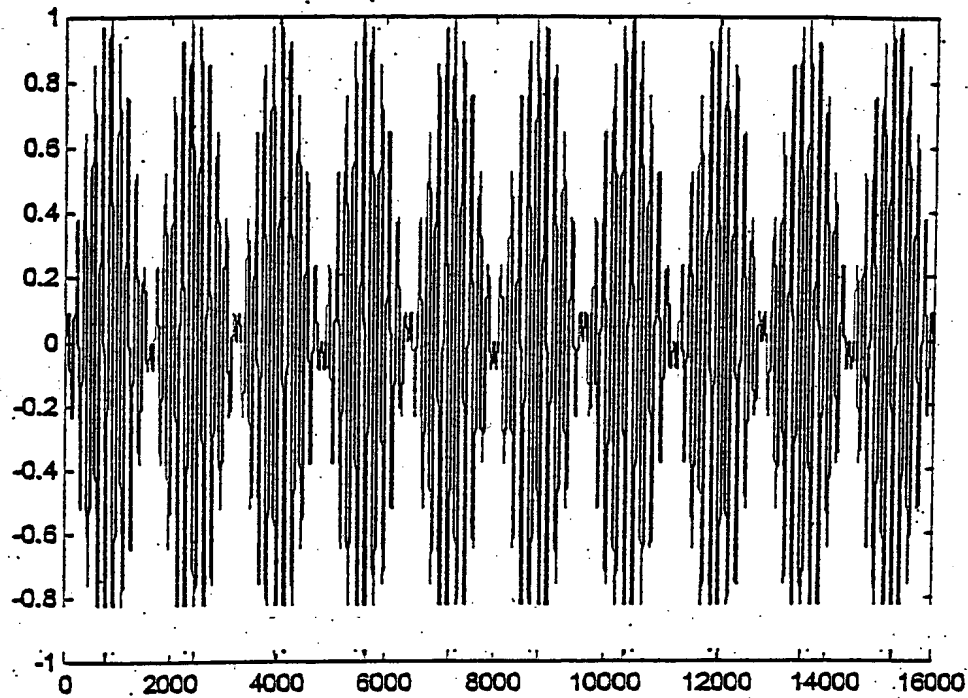
a single superposition

Signal (can include

step at adjusting relative

amplitudes)

FIGURE 14



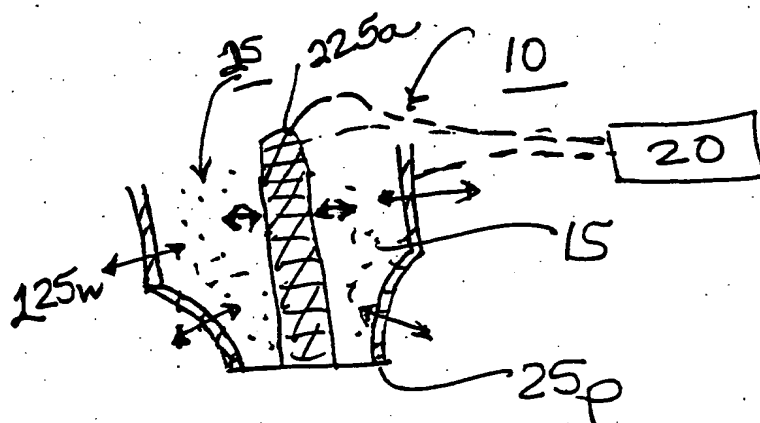


Fig. 5A

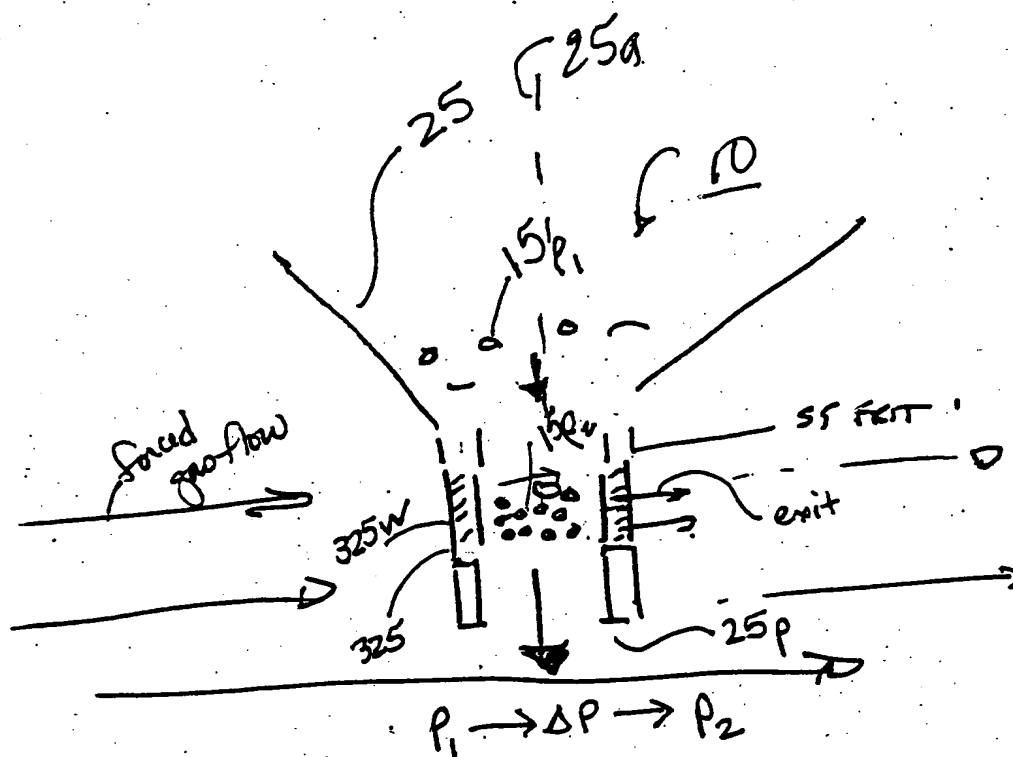


Fig. 5B

NON-LINEAR VIBRATION / CENTRIFUGATION PRINCIPLE OF POWDER FILLING.

BASIC PRINCIPLE:

COMBINE NON-LINEAR FUNCTION
WITH CENTRIFUGAL MOTION

THIS CAN BE ADAPTED
TO LOCAL NON-LINEAR
VIBRATION.

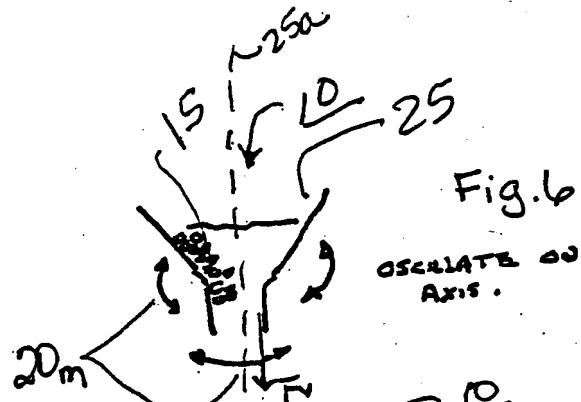


Fig. 6

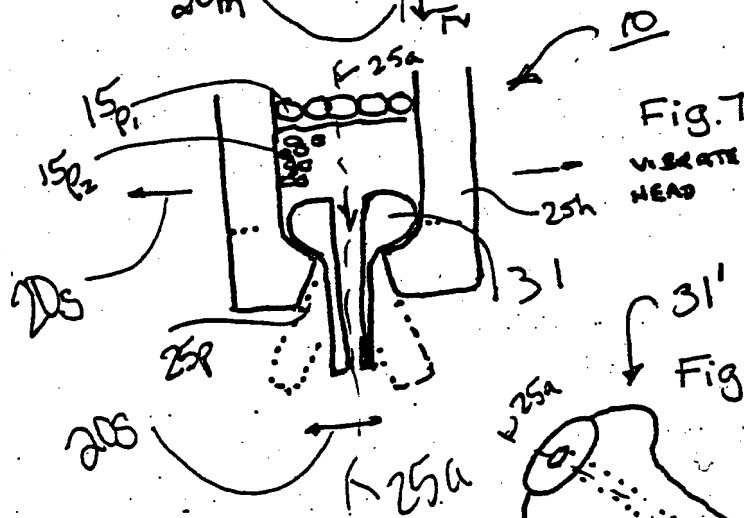


Fig. 7

VIBRATE
HEAD

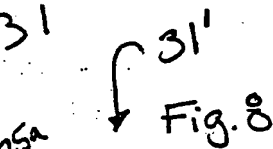


Fig. 8

DIAGRAM OF
OSCILLATING
INSERT.

VIBRATION CAN BE
APPLIED TO A
RACK OF HEADS FILLING
FROM SINGLE HOPPER.

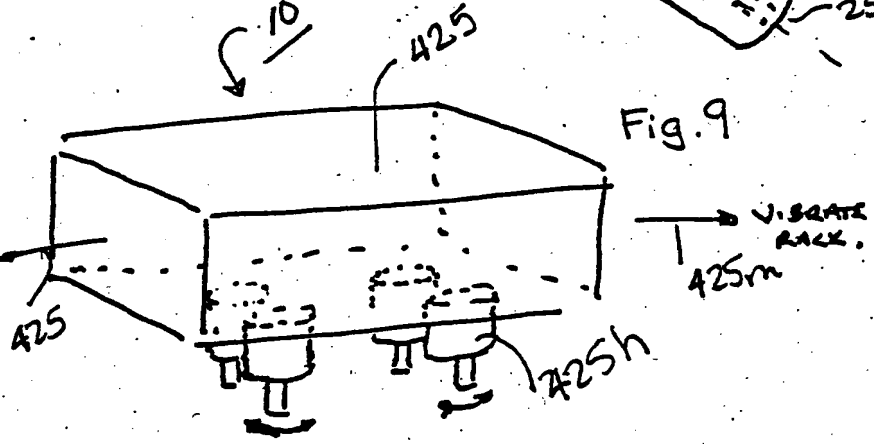
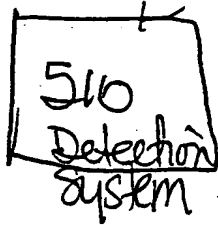


Fig. 9

VIBRATE
RACK.

RADIUS (OR EXTREMES) OF MOTION CAN BE VERY SMALL. AT HIGH FREQUENCY
THE ANGULAR VELOCITY WILL BE SUFFICIENT TO GIVE DIRECTIONAL
ACCELERATION TO PARTICLES.



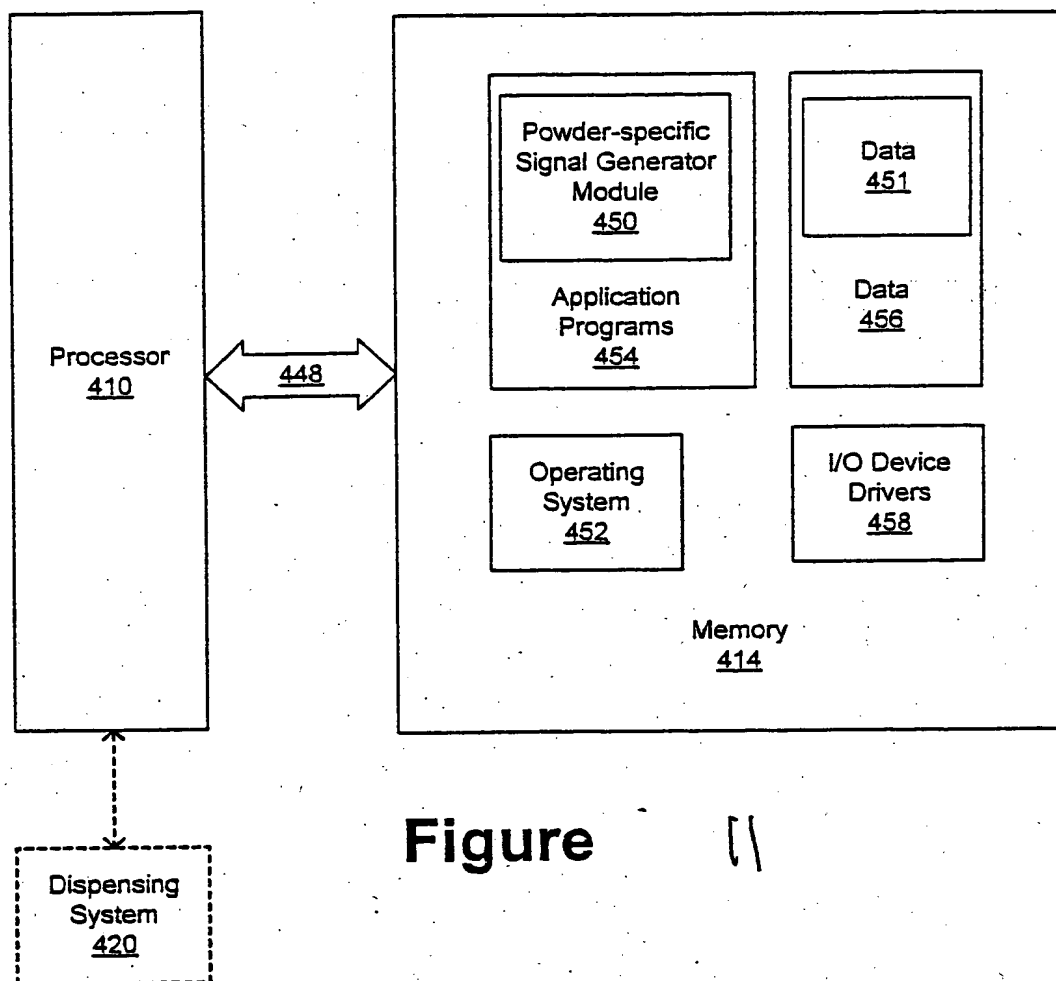


Figure 11

FIGURE 12

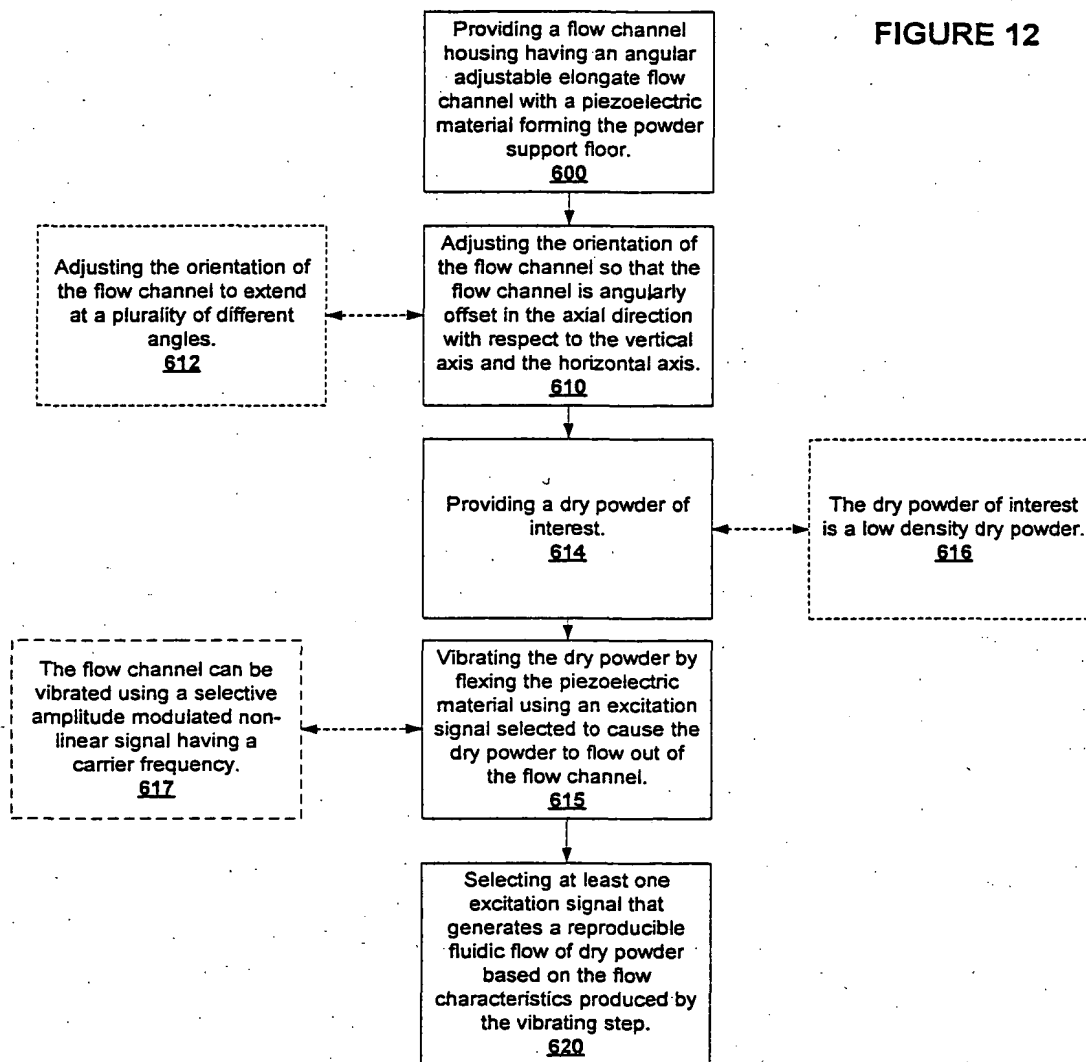
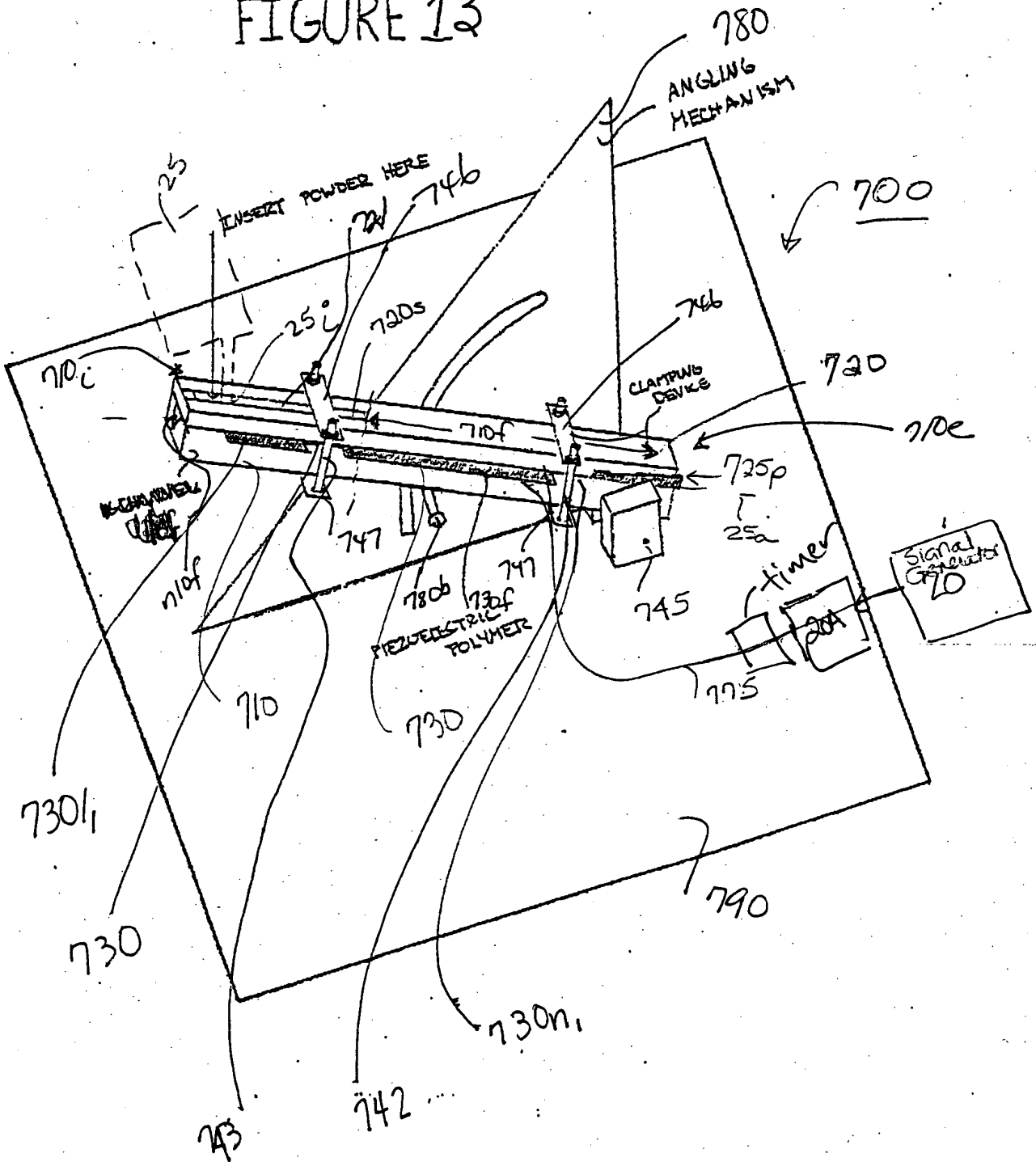


FIGURE 13



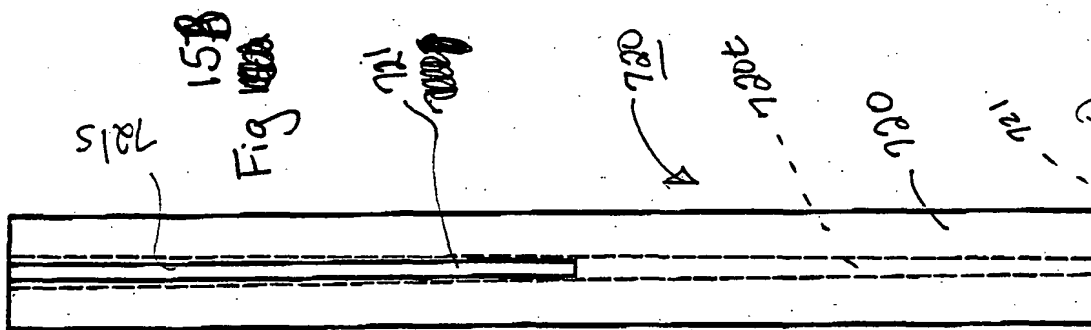


Fig 15B

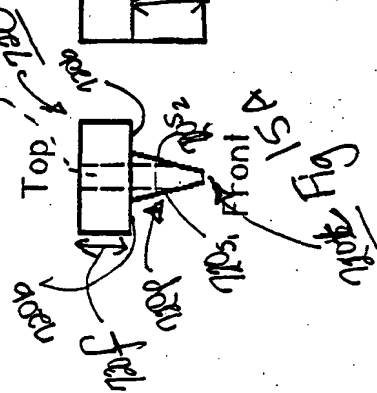


Fig 15C

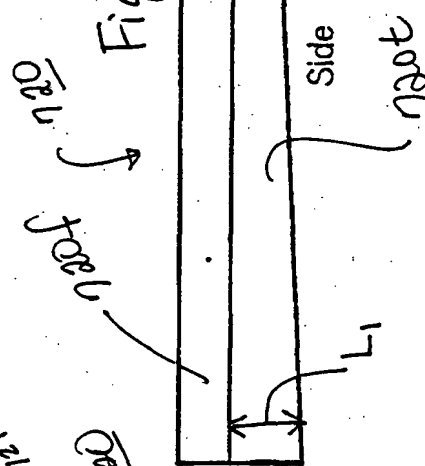


Fig 15D

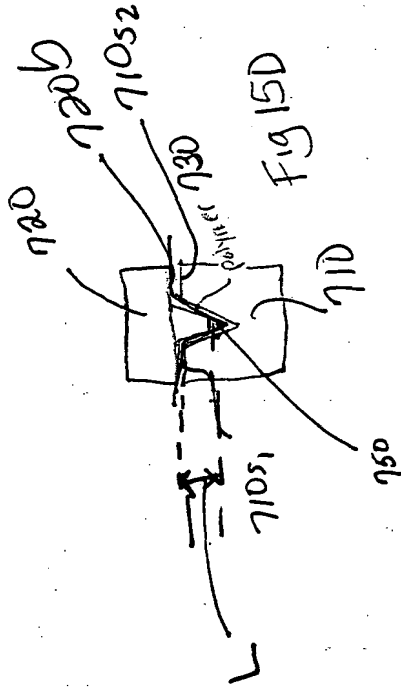


Fig 15E

NOT TO SCALE

Part 3: Piezoelectric Polymer
NOT TO SCALE

